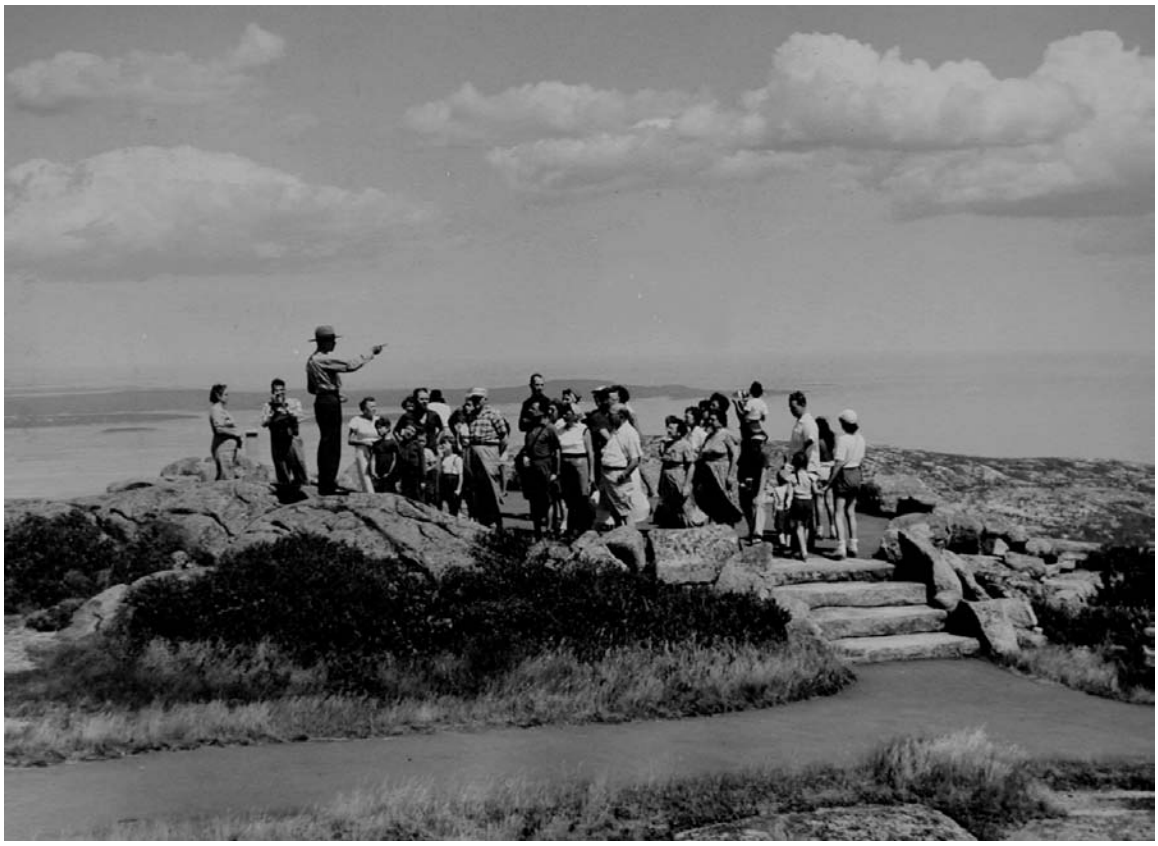
Acadia National Park

National Park Service
U.S. Department of the Interior

# A Census of Vehicles and Visitors to Cadillac Mountain, Acadia National Park, August 1, 2002



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## CONTENTS



## TABLES

## INTRODUCTION

Cadillac Mountain in Acadia National Park is the highest point on the eastern seaboard of the United States. Four hiking trails and an auto road lead to the summit, providing unparalleled views of the spruce-clad Maine archipelago. Acadia is one of the ten most visited national parks and Cadillac Mountain is a major destination for visitors to Acadia. The park received an estimated 2.47 million recreation visits in 2000. In a recent visitor survey, 76% of respondents said they visited Cadillac Mountain (Littlejohn 1999).

Cadillac Mountain is also important ecologically. Acadia's granite summits, including Cadillac, serve as habitat for several State-listed rare plant species. A short growing season, severe weather, and thin soils make Cadillac and other summits a tough place for plants to grow. Plants in this type of environment are slow to recover from damage caused by natural events or human use. With very high visitor use occurring in a very small and sensitive environment, conditions at the summit of Cadillac are no surprise. The loss of soil and plant cover is obvious and extensive. The National Park Service has struggled with how to manage the summit area to protect its important resources while allowing visitors to continue to enjoy it. Crowding and congestion of vehicles and visitors is also a concern.

In 2000, a University of Maine Graduate student conducted a study of visitor behavior to help the park gain a better understanding of how people used the summit (Turner in prep). In addition, a Carrying Capacity Charrette held August 1-3, 2001 specifically addressed visitor issues on Cadillac. Results of the Charrette illustrated the need for information on how many cars and people visit the summit on a typical summer day. Some of this information will be available from the Intelligent Transportation System Project in 2002, but we decided it was worthwhile to get some information sooner.

The purpose of this study was to repeat a snapshot census in 2001 of the amount and type of visitor and vehicle use of Cadillac Mountain for one day during the busy summer season. This information may be useful in a number of ways. First, it provides a basis for estimating very roughly the annual visitation to the summit, and gives an equally rough estimate of the relationship between visitor use and resource impacts. Second, it provides a framework for a limitation in use should park managers wish to consider a capacity for the mountaintop. Third, it offers data for park managers and planners interested in extending the Island Explorer Bus up the mountain. This bus system was introduced in 1999 to help reduce traffic congestion on Mount Desert Island and in the park, and has proved to be an attractive option for many visitors.

## METHODS

The methods for this census of visitor use of Cadillac Mountain combined direct counts with estimations from previous work or from best judgment. Most of the census consisted of park staff or volunteers counting vehicles and visitors from the overlook for the South Ridge of Cadillac Mountain along the 3.5-mile summit road. This overlook is

at the southernmost point on the summit road, and is about 100 yards south of the Blue Hill Parking Area and 0.2 miles from the summit parking area. We stationed observers here from 0500 hours until 2000 hours on Thursday August 1, 2002. Sunrise was at 5:14 a.m. and sunset at 7:48 p.m. Shifts were generally about three hours. The first week in August is traditionally very busy in the park. The weather was sunny and warm, although some clouds came in during the last three hours to make for a cloudy-hazy sunset. We counted the following categories of use (numbers) each hour: cars and vans; recreational vehicles; coach bus tours; local bus tours (Oli's Trolley, National Park Tours); school buses; bicycles; motorcycles and mopeds; and the total number of people. The data recording form is in Appendix 1.

We used these guidelines for counting people. Until it was light enough to see into vehicles, we used two persons per car/van to estimate the number of people. This included cars already parked in the summit lot upon arrival at 5:00 a.m. After sunrise, we counted the number of people in each car or van as best we could. It was difficult to see into RVs, vans, and sport utility vehicles, especially those with tinted windows. We counted only the people that we actually saw in these vehicles. For coach buses, we used 40 persons per bus as a multiplier. For local tour buses and schools buses, we used 20 persons per bus as a multiplier. For motorcycles/mopeds and bicycles, we counted each person on board. Runners were recorded as bicyclists for convenience. Two hand held counters were used—one for the vehicles and one for the people. These were reset to zero each hour. We recorded other data with simple tic marks, and totaled after each hour.

We estimated the number of people visiting Cadillac Mountain on this day by adding the following figures:

1. The number of people counted in cars and vans, RVs, and on motorcycles, mopeds, and bicycles.
2. The number of coach buses times 40 persons per bus.
3. The number of local tour busses and school busses times 20 persons per bus.
4. The estimated number of hikers based on data from three trails censuses conducted in 1999, 2000, and 2001 (Chase and Jacobi 2000, Jacobi 2001a, and Jacobi 2001b). Only the North Ridge Trail, South Ridge Trail, and West Face Trail were used for this estimate, because it was only for these trails that we could be relatively certain the hiker destination was Cadillac Mountain.

## RESULTS AND DISCUSSION

Table 1 shows the results of the census. The last column, total number of people, includes all people counted in cars, vans, and RVs, on bicycles, motorcycles, and mopeds, and estimated on busses. There were 100 cars in the summit parking area on arrival at 0515 hours; these are included in the 120 cars for the 0500 to 0600 hour with an estimated 2 persons per vehicle.

More than1,700 vehicles drove to the summit of Cadillac Mountain on this day carrying an estimated 4,930 persons. An estimated 360 of these persons arrived on coach buses and local tour buses. Adding an estimated 223 trail hikers for the day gives an estimate of 5,153 people visiting the summit on this day. This was about 1,000 fewer people and about 300 fewer vehicles than the census on August 14, 2001.

The pattern of visitor use for this day started with a good number of people arriving early for sunrise. Visitation dropped off dramatically after sunrise. From 0600 to 0900 hours use was at its lowest for the entire day. From 1000 to 2000 hours, an average of 145 vehicles carrying 422 people ascended to the summit per hour. Peak vehicle use was 194 from 1100-1200 hours. The number of people peaked between 1000 and 1100 hours at 566 because of three coach busses and two local bus tours. The parking area holds 131 cars and 2-3 busses. Length of stay on Cadillac appears relatively short; at the rate of 150-200 vehicles per hour, vehicles have to be going down relatively quickly or else there would be total gridlock. Unfortunately, we were not able to have observers recording congestion in the parking lot during this 15 hours. Evening hours (1700 to 2000 hours) were somewhat less used than the middle part of the day but were still busy. Normally, sunset is a very popular time, and we can probably expect higher use on evenings with clearer skies.

There is no way to know whether the number of busses counted on this day is representative of a typical day of visitation. It seems likely that overall bus use could be substantially higher on other days, particularly in the late summer or in the fall.

**Table 1: Cadillac Mountain Visitor and Vehicle Census Data for August 1, 2002.**

| Time[1] | # of Cars/Vans | # of RVs | # of Coach Busses | # of Local Busses | # of School Busses | # of Bikes | # of M'cycles / Mopeds | # of People[2] |
|---|---|---|---|---|---|---|---|---|
| 0500 | 120 | 2 | 0 | 0 | 0 | 1 | 1 | 247 |
| 0600 | 3 | 0 | 0 | 0 | 0 | 2 | 0 | 8 |
| 0700 | 11 | 0 | 0 | 0 | 0 | 5 | 0 | 25 |
| 0800 | 25 | 0 | 0 | 0 | 0 | 2 | 3 | 62 |
| 0900 | 80 | 1 | 0 | 0 | 0 | 0 | 1 | 188 |
| 1000 | 144 | 2 | 3 | 2 | 0 | 3 | 9 | 566 |
| 1100 | 194 | 0 | 0 | 0 | 0 | 2 | 15 | 545 |
| 1200 | 145 | 2 | 0 | 2 | 0 | 1 | 11 | 455 |
| 1300 | 157 | 0 | 1 | 0 | 0 | 1 | 5 | 433 |
| 1400 | 140 | 0 | 0 | 2 | 0 | 0 | 9 | 419 |
| 1500 | 154 | 0 | 1 | 0 | 0 | 1 | 2 | 471 |
| 1600 | 170 | 0 | 0 | 2 | 0 | 4 | 1 | 531 |
| 1700 | 96 | 1 | 0 | 0 | 0 | 1 | 5 | 279 |
| 1800 | 109 | 0 | 0 | 0 | 0 | 2 | 4 | 307 |
| 1900 | 138 | 0 | 0 | 0 | 0 | 3 | 1 | 394 |
| **Total** | **1686** | **8** | **5** | **8** | **0** | **28** | **67** | **4930** |

[1] Military time.

[2] Includes all people counted in cars, vans, and RVs, on bicycles, motorcycles, and mopeds, and estimated in buses.

There are no plans to repeat this census again. Some of this information will be collected automatically in 2002 by the new Intelligent Transportation Systems (ITS) infrastructure. However, the ITS data collection focuses on vehicles, not people. We should also remember that the visitor impacts on the summit are more important than the number of people visiting. Since most visitor impacts to soils and vegetation have been shown to occur at low levels of visitor use (Kuss at al 1990), this census demonstrates the challenge of managing Cadillac Mountain to protect its natural resources. Even huge reductions in visitor use (1/2, 2/3 e.g.), assuming they were politically feasible, would still leave hundreds of thousands of visitors. The impacts of this still large number of visitors on the soils and vegetation of Cadillac Mountain would probably remain very high.

The National Park Service will continue to study visitor use of Cadillac Mountain to gain an understanding of how visitors can be accommodated while still protecting its important resources.

## REFERENCES


Chase, G. and C. Jacobi

2000 A census of hiking trail use in Acadia National Park, August 3 and 4, 1999. Acadia National Park Natural Resources Report 2000-02. February. 8pp.

Jacobi, C.

2001a A census of hiking trail use in Acadia National Park, August 1 and 3, 2000. Acadia National Park Natural Resources Report 2001-02. February. 8pp.

Jacobi, C.

2001b A census of hiking trail use in Acadia National Park, August 7 and 8, 2001. Acadia National Park Natural Resources Report 2001-10. December. 10 pp.

Kuss, F.R., A.R. Graefe, and J.J. Vaske

1990 Visitor impact management, a review of research. Volume 1 of a two volume report examining visitor impact management for the national parks and other recreation lands. National Parks and Conservation Assn. Washington D.C. 256 pp.

Littlejohn, M.

1999 Acadia National Park visitor study: summer 1998. Visitor Services Project Report 108. May 1999. Cooperative Park Studies Unit, University of Idaho. 106 pp.

Turner, R. and W. Lapage

In prep Visitor behaviors and resource impacts at Cadillac Mountain, Acadia National Park. Draft Report under Cooperative Agreement with the University of Maine.

| **APPENDIX 1: Cadillac Mountain Count: Record the number of vehicles in each block!! Use one clicker to count autos for each hour and one to total the # of people for each hour (except for people on buses). Use tic marks for bikes, m'cycle, buses, and RVs and enter the number for each hour. If you can't see in vehicles, do the best you can.** | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Time** | **Cars/Vans** | **RVs** | **Coach Bus Tours** | **Local Bus Tours** | **School Buses** | **Bikes** | **M'cycles/ Mopeds** | **Total People** |
| **5** | | | | | | | | |
| **6** | | | | | | | | |
| **7** | | | | | | | | |
| **8** | | | | | | | | |
| **9** | | | | | | | | |
| **10** | | | | | | | | |
| **11** | | | | | | | | |
| **12** | | | | | | | | |

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|---|---|---|---|---|---|---|---|---|
| **Time** | **Cars/Vans** | **RVs** | **Coach Bus Tours** | **Local Bus Tours** | **School Buses** | **Bikes** | **M'cycles/ Mopeds** | **Total People** |
| **13** | | | | | | | | |
| **14** | | | | | | | | |
| **15** | | | | | | | | |
| **16** | | | | | | | | |
| **17** | | | | | | | | |
| **18** | | | | | | | | |
| **19** | | | | | | | | |
| **20** | | | | | | | | |